

PROPERTY PLANNING COMMON ELEMENTS

COMPONENTS OF MASTER PLANS

HABITATS AND THEIR MANAGEMENT

Nearshore Practices

Description

Nearshore habitats of lakes and impoundments play a critical role in maintaining the health and diversity of aquatic biota. Remarkably, 80% of the plants and animals on the state's endangered and threatened species list spend all or part of their lifecycle within the nearshore zone. As many as 90% of the living things in lakes and rivers are found along their shallow margins and shores.

In their natural state, lake shorelines commonly grade from trees and shrubs on drier land farther from the water into a mix of wetland and aquatic plants on the moist soils of the lake bank and into the shallow nearshore waters. These plants, which can be a mix of emergent, submergent, and floating-leaved species, represent important habitat for fish, waterfowl, amphibians, and reptiles, providing hiding and nesting cover as well as substrate for periphyton and invertebrates, which play a key role in food availability.

Large wood cover is another important component of nearshore habitats. Trees that fall into the nearshore zone form coarse wood habitat that provides shelter and feeding areas for a diversity of fish species as well as nesting and sunning areas for birds, turtles, and other animals above the water. Tree-falls also protect shorelines by blunting wave and ice action that can scour the lakebed and keep seeds or shoots of aquatic plants from sprouting or rooting. Nearshore habitats that host diverse aquatic plants and habitat complexity from abundant coarse wood cover have greater richness and abundance of fish and other aquatic species.

Shoreline development negatively impacts aquatic vegetation and coarse wood habitats in the nearshore zone by replacing overhanging trees, submerged woody debris, and wetland plants with structures and features such as rip-rap, retaining walls, piers or docks, sand blankets, and lawn. Development can also affect the nearshore zone through indirect impacts such as introduction of sediments and nutrients and increased wave action and erosion from recreational boating.

Nearshore practices include the restoration or rehabilitation of emergent/floating-leaved plant beds and coarse wood habitat. These initiatives generally involve a variety of cooperators, including lakefront property owners, lake associations or districts, DNR permitting and fisheries staff, county land and water conservation departments, and possibly federal agencies. All applicable [water permits](#) must be obtained before work begins.

Emergent/floating-leaved Plant Bed Rehabilitation

Many nearshore aquatic plant restoration projects focus on hardstem bulrush, as this species has high value for wildlife food and cover and as a soil stabilizer due to its dense root mass, and is often impacted by development more than other wetland plants due to its sensitivity to physical damage and to degraded water quality. A variety of techniques can be used, ranging from planting stock directly into the water to various methods of anchoring rootstock with geo-jute fiber, burlap bags and tires. Rootstock can easily be planted in the water with a shovel.



Considerations

- Sites with gently-sloping shorelines and hard, sandy substrates protected from wind and wave action (e.g., tributary areas, wind-protected embayments) are most suitable. Where drawdowns are not possible, rootstock that can be planted in several inches of water should be used, as seedlings require exposed mudflats to successfully establish.
- Rootstock should come from well-established beds located as close as possible to the restoration site. Harvesting and transplanting should occur in the same day to avoid stressing plants.
- The use of wave breaking structures is encouraged during initial phases of establishment.

Large Woody Cover Restoration

“Fish sticks” projects are intended to restore woody habitat in lakes by adding trees to the near-shore area. They are large woody habitat structures that use either single trees or trees grouped together. Fish sticks structures are anchored to the shore and are partially or fully submerged near the shoreline of a lake. Fish sticks projects are completed to provide additional fish habitat, as well as to expand fishing opportunities for anglers and provide protection to shorelines. Additional information on fish sticks and the fish sticks implementation process can be found in the [Fish Sticks Best Practices Manual](#).

Considerations

- How long woody debris lasts in water depends on the size and type of wood, water temperature, and sedimentation rate. Logs outlast branches and buried or submerged wood outlasts exposed wood. Conifer species contain higher levels of compounds that retard decomposition of their heartwood. Eastern white pine, for example, decays very slowly; with a residence time in the nearshore zone of 100 to 900 years. Decay rates increase with water temperature, especially in aerobic environments.
- Fish sticks projects typically are conducted on lakes where the density of trees in the water is less than 200 trees/mile of shoreline (tree defined as a piece of wood ≥ 6 feet with a diameter ≥ 6 inches).
- It is important to keep fish sticks complexes away from high-use areas such as docks or swimming areas as well as from the property line so as not to interfere with the neighbors’ use of the shoreline. Consideration should be given to water depth and potential for ice-heave. In general, water depth should be greater than 2 feet at 50 feet from the shore to obtain ideal benefits from wood additions.
- If ice-heave is a concern, structures should be placed with the butt end of the tree pulled 10 to 15 feet landward and cabled directly to a tree. This will help the structure remain in place if ice-heave does occur. When in a bay or area not exposed to ice-heave, the butt ends can be placed at the toe of the bank (“low energy sites”).

